MAR 4 192

SUPPLEMENT TO THE

BULLETIN OF BUSINESS RESEARCH

OHIO STATE UNIVERSITY, COLUMBUS

Vol. IV FEBRUARY, 1929 Number 1

ANALYSIS OF TYPES AND SQUARE FOOT VALUE OF CONSTRUCTION CONTRACTS AWARDED IN OHIO, OHIO CITIES, AND OTHER AREAS, 1927-1928

Significance of Distribution Figures

As a result of a change in the form of reporting of the F. W. Dodge Corporation, it is possible to secure data for the chief cities of Ohio showing from month to month and from year to year not only the total volume of construction in terms of floor space and in terms of money cost, but also how much of this work is devoted to the various types of construction. By thus showing the nature of construction in the various areas it is possible to arrive at tentative conclusions in regard to the type of industrial development in these areas. The data available cover two years, 1927 and 1928, and the totals for this period form the basis of the material to be presented in this Supplement. The data are, of course, not conclusive with respect to the trend of construction in the chief cities of Ohio but they do measure and describe the nature of construction in these cities during the past two years. It should be noted that the city data as reported by the F. W. Dodge Corporation cover the suburbs as well as the area defined by the city limits of the cities in question.

Industrial Construction

Under the caption of industrial construction is included the construction of industrial plants other than those in the public utility field, which are included under a separate caption. It will be noted in Table I that during the past two years industrial construction has represented a higher percentage of total construction in Toledo than in any of the larger cities of Ohio. This is true both for the floor space and for the value of construction contracts awarded. The table shows that 17.5 per cent of the floor space, and 20.5 per cent of the value of construction contracts awarded in Toledo in 1927 and 1928 represented industrial construction. Cleveland ranks second in the table and Akron ranks third.

TABLE I

INDUSTRIAL CONSTRUCTION CONTRACTS IN DESIGNATED AREAS AS PERCENTAGES OF TOTAL CONSTRUCTION CONTRACTS IN THE RESPECTIVE AREAS

Computed from Two Year Totals, 1927-1928

Source: F. W. Dodge Corporation

Region or City	Percentages Based on Floor Space	Percentages Based on Value
37 Eastern States	9.2%	8.7%
Pittsburgh District	12.9	11.8
Ohio	11.5	9.9
Ohio Cities		
Toledo	17.5	20.5
Cleveland	14.5	12.1
Akron	11.9	10.6
Dayton	7.8	5.8
Columbus	7.1	6.1
Cincinnati	5.6	4.0
Youngstown	2.9	1.4

Residential Construction

It will be observed in Table II that the order of the chief cities of Ohio in the percentage which residential construction formed of total construction in 1927-1928 is, in general, a reverse order to that found in Table I, based on industrial construction. Cincinnati, Columbus, Youngstown, and Dayton are above the State average while Akron, Toledo, and Cleveland are below it. Tables I and II are suggestive of the industrial development which is taking place in the Lake Erie region.

TABLE II

RESIDENTIAL CONSTRUCTION CONTRACTS IN DESIGNATED AREAS AS PERCENTAGES OF TOTAL CONSTRUCTION CONTRACTS IN THE RESPECTIVE AREAS

Computed from Two Year Totals, 1927-1928

Source: F. W. Dodge Corporation

Region or City	Percentages Based on Floor Space	Percentages Based on Value
37 Eastern States	58.5%	41.6%
Pittsburgh District	50.9	32.2
Ohio	54.0	35.7
Ohio Cities		
Cincinnati	68.2	54.5
Columbus	66.3	53.2
Youngstown	62.1	34.5
Dayton	59.8	53.2
Akron	50.6	37.1
Cleveland	45.1	34.7
Toledo	35.1	20.9

Commercial Construction

A comparison of Tables I and III indicates that commercial construction is relatively important in the areas where industrial construction constitutes a large percentage of the total. With one exception the ranking of the 7 cities in the two tables is identical. Toledo, Akron, and Cleveland stand highest in the percentage which commercial construction contracts represented of the total in the respective areas in 1927-1928, each of these cities being above the State average.

TABLE III

COMMERCIAL CONSTRUCTION CONTRACTS IN DESIGNATED AREAS AS PERCENTAGES OF TOTAL CONSTRUCTION CONTRACTS IN THE RESPECTIVE AREAS

Computed from Two Year Totals, 1927-1928

Source: F. W. Dodge Corporation

Region or City	Percentages Based on Floor Space	Percentages Based on Value
37 Eastern States	16.6%	14.0%
Pittsburgh District	15.9	10.8
Ohio	15.9	10.5
Ohio Cities		
Toledo	33.8	24.0
Akron	27.6	18.2
Cleveland	18.9	13.5
Dayton	14.6	12.9
Columbus	14.2	12.8
Cincinnati	13.2	11.9
Youngstown	12.5	5.3

Educational Construction

The interesting fact revealed by Table IV is that the relative importance of educational construction in terms of floor space was greater in the State in 1927-1928 than in any of the 7 listed cities. The table shows that 7.9 per cent of the floor space of construction contracts awarded in Ohio in 1927-1928 represented educational construction. Dayton and Cincinnati appear in first and second places, respectively, in regard to the relative importance of educational construction.

TABLE IV

EDUCATIONAL CONSTRUCTION CONTRACTS IN DESIGNATED AREAS AS PERCENTAGES OF TOTAL CONSTRUCTION CONTRACTS IN THE RESPECTIVE AREAS

Computed from Two Year Totals, 1927-1928

Source: F. W. Dodge Corporation

Region or City	Percentages Based on Floor Space	Percentages Based on Value
37 Eastern States	6.5%	6.0%
Pittsburgh District	9.0	6.5
Ohio	7.9	6.2
Ohio Cities		
Dayton	7.6	8.4
Cincinnati	6.1	6.2
Cleveland	5.7	5.2
Columbus	4.5	5.7
Toledo	4.5	4.4
Akron	1.8	1.7

Public Utility Construction

Value rather than floor space is the proper measure of the relative importance of public utility construction, as can be seen from Table V. For the two-year period, 1927-1928, public utility construction contracts in Ohio accounted for 28.1 per cent of the State total in terms of value. Among the cities, only the figure for Youngstown (39.5 per cent) exceeded this State percentage. Youngstown, Cleveland, and Toledo stand out in terms of the relative importance of the value of public utility construction.

TABLE V

PUBLIC UTILITY CONSTRUCTION CONTRACTS IN DESIGNATED AREAS AS PERCENTAGES OF TOTAL CONSTRUCTION CONTRACTS IN THE RESPECTIVE AREAS

Computed from Two Year Totals, 1927-1928

Source: F. W. Dodge Corporation

Region or City	Percentages Based on Floor Space	Percentages Based on Value
37 Eastern States	.9%	20.1%
Pittsburgh District	1.6	29.0
Ohio	2.1	28.1
Ohio Cities		
Cleveland	6.6	22.4
Youngstown	5.8	39.5
Cincinnati	2.1	15.3
Toledo	.8	21.1
Columbus	.02	13.6
Akron	.01	14.0
Dayton	—	8.1

Value of Industrial Construction Contracts per Square Foot

The average value of construction contracts awarded in Ohio cities should be of some interest in connection with valuation problems, although it must be recognized that variation between years and between cities may be caused by varying factors, chief among these being differences in types of structures. Table VI shows the average value per square foot of construction contracts awarded in Ohio cities in 1927 and 1928 as compared with the same value in the Pittsburgh district, the State of Ohio, and 37 Eastern States. Since industrial construction shows a very considerable variation in types of structures, the average value data for this type of construction show a considerable degree of instability. It will be noted from a comparison of Tables I and VI that the value per square foot in industrial construction is highest in those cities in which the volume of industrial construction has been highest in percentage of total construction. Toledo, Akron, and Cleveland occupy the first three ranks in both Tables I and VI, while Youngstown is last in both tables. The range for the two-year period is from $2.73 to $9.48 per square foot.

TABLE VI

VALUE PER SQUARE FOOT OF INDUSTRIAL CONSTRUCTION CONTRACTS AWARDED IN DESIGNATED AREAS

1927-1928

Source: F. W. Dodge Corporation

Region or City	Value Per Square Foot		
	1927	1928	1927–1928
37 Eastern States	$6.97	$6.66	$6.79
Pittsburgh District	8.73	7.10	7.78
Ohio	7.64	6.27	6.86
Ohio Cities			
Toledo	9.15	9.48	9.34
Akron	7.12	5.36	6.05
Cleveland	6.57	5.27	5.90
Columbus	5.64	5.14	5.29
Cincinnati	4.71	4.87	4.81
Dayton	3.96	5.77	4.81
Youngstown	4.64	2.73	3.79

Value of Residential Construction Contracts per Square Foot

Table VII shows that the value per square foot of residential construction was relatively high in 1927 and 1928 in Dayton and Cincinnati, whereas the value per square foot of industrial construction in these cities was relatively low, as shown in Table VI. This suggests that the high value per square foot of industrial construction in these cities may be due to the type of construction rather than to low construction costs. The range of values per square foot in residential construction contracts awarded in 1927 and 1928 in the Ohio cities listed in Table VII is from $4.43 to $6.01. The fact that there is a range here of only $1.58 per square foot in the value of residential construction contracts gives the Ohio average of $5.27 per square foot for the two-year period, 1927 and 1928, considerable importance as a rough estimate of the cost of residential construction.

TABLE VII

VALUE PER SQUARE FOOT OF RESIDENTIAL CONSTRUCTION CONTRACTS AWARDED IN DESIGNATED AREAS

1927-1928

Source: F. W. Dodge Corporation

Region or City	Value Per Square Foot		
	1927	1928	1927–1928
37 Eastern States	$5.20	$4.92	$5.05
Pittsburgh District	5.37	5.37	5.37
Ohio	5.28	5.25	5.27
Ohio Cities			
Dayton	6.01	5.23	5.77
Cincinnati	5.44	5.45	5.45
Cleveland	5.44	5.45	5.44
Akron	5.12	4.88	5.00
Columbus	4.89	4.85	4.87
Toledo	4.61	4.86	4.74
Youngstown	4.67	4.43	4.51

Value of Commercial Construction Contracts per Square Foot

The average value per square foot of commercial construction contracts awarded in Ohio, Ohio cities, and other areas in 1927 and 1928 is shown in Table VIII. Cincinnati and Dayton show the highest values in Table VIII as they did in Table VII, based on residential construction. The two tables indicate considerable correlation between the square-foot values of residential and commercial construction. It is significant that the average value per square foot of commercial construction contracts in Ohio in 1927-1928 was almost exactly equal to the value per square foot of residential construction contracts in the same period.

TABLE VIII

VALUE PER SQUARE FOOT OF COMMERCIAL CONSTRUCTION CONTRACTS AWARDED IN DESIGNATED AREAS

1927-1928

Source: F. W. Dodge Corporation

Region or City	Value Per Square Foot		
	1927	1928	1927–1928
37 Eastern States	$6.58	$5.56	$6.04
Pittsburgh District	6.33	5.22	5.76
Ohio	5.78	4.89	5.26
Ohio Cities			
Cincinnati	6.56	5.81	6.16
Dayton	6.06	5.38	5.76
Toledo	5.99	5.18	5.66
Columbus	6.14	4.51	5.50
Cleveland	5.63	4.80	5.05
Akron	5.32	3.92	4.50
Youngstown	3.29	3.61	3.43

Value of Educational Construction Contracts per Square Foot

The value per square foot of educational construction contracts awarded in Ohio, Ohio cities, and other areas in 1927 and 1928 is shown in Table IX. The wide range in the figures again suggests that the style of construction is probably more important in determining the rank of the various cities than the variation in construction costs. The average value of educational construction contracts awarded in Ohio in 1927 and 1928 was $1.00 per square foot higher than the value of residential or commercial construction contracts awarded in Ohio in the same period.

TABLE IX

VALUE PER SQUARE FOOT OF EDUCATIONAL CONSTRUCTION CONTRACTS AWARDED IN DESIGNATED AREAS

1927-1928

Source: F. W. Dodge Corporation

Region or City	Value Per Square Foot		
	1927	1928	1927–1928
37 Eastern States	$6.85	$6.34	$6.57
Pittsburgh District	6.33	5.93	6.14
Ohio	6.54	5.98	6.27
Ohio Cities			
Youngstown	6.95	30.29	7.65
Toledo	9.38	5.51	7.63
Columbus	6.16	8.80	7.58
Dayton	6.69	11.11	7.23
Cincinnati	8.42	6.39	7.01
Akron	6.47	6.43	6.45
Cleveland	6.87	5.93	6.39

The Supporting Data

The data from which the percentages and square foot values contained in Tables I to IX were computed are listed in Table X (page 4). The table shows the square foot areas and values represented by construction contracts of the several classes awarded in 37 Eastern States, the Pittsburgh district, Ohio, and 7 Ohio cities in 1927 and 1928, as reported by the F. W. Dodge Corporation.

TABLE X

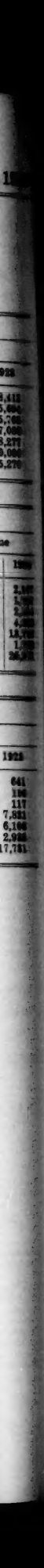
CONSTRUCTION CONTRACTS AWARDED IN DESIGNATED AREAS

In Thousands of Square Feet of Floor Space and in Thousands of Dollars of Value

1927-1928

Source: F. W. Dodge Corporation

Classes	37 Eastern States				Pittsburgh District				Ohio			
	Floor Space		Value		Floor Space		Value		Floor Space		Value	
	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928
Commercial	141,815	159,192	932,911	884,610	13,451	14,290	85,179	74,551	7,931	9,904	45,468	48,413
Educational	55,475	62,983	379,796	398,997	8,166	7,607	51,672	45,098	4,547	4,295	29,746	25,[illegible]
Industrial	70,855	95,382	494,049	635,390	9,252	13,199	80,787	93,767	5,534	7,301	42,283	45,[illegible]
Public Utilities	9,553	7,238	1,268,835	1,337,931	983	1,794	212,093	218,007	774	1,581	133,348	117,[illegible]
Residential	494,563	567,831	2,573,317	2,794,317	46,488	42,219	249,594	226,592	30,209	30,134	159,490	158,27[illegible]
Others	78,317	73,381	659,148	583,041	8,850	8,060	78,809	65,401	4,788	4,845	44,926	40,[illegible]
Total	850,576	966,006	6,303,055	6,634,286	87,188	87,170	758,135	723,416	53,782	58,059	455,262	435,[illegible]

Classes	Akron				Cincinnati				Cleveland				Columbus			
	Floor Space		Value		Floor Space		Value		Floor Space		Value		Floor Space		Value	
	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1[illegible]
Commercial	937	1,309	4,984	5,127	939	1,065	6,158	6,190	1,338	3,085	7,538	14,808	718	468	4,406	2,[illegible]
Educational	59	84	380	540	281	640	2,364	4,087	651	699	4,470	4,148	175	203	1,077	1,[illegible]
Industrial	383	584	2,725	3,127	314	543	1,481	2,646	1,658	1,740	10,891	9,170	174	415	980	2,[illegible]
Public Utilities	1	—	4,500	3,276	311	12	10,090	5,819	128	1,430	22,442	14,638	1	—	2,468	4,[illegible]
Residential	1,998	2,119	10,239	10,353	4,875	5,500	26,513	29,988	5,350	5,228	29,091	28,471	2,709	2,836	13,234	13,[illegible]
Others	505	156	3,030	2,182	356	368	3,872	4,490	938	1,215	9,022	10,949	401	260	2,651	1,[illegible]
Total	3,882	4,252	30,858	24,605	7,075	8,128	50,477	53,219	10,062	13,398	83,454	82,183	4,177	4,182	24,810	25,[illegible]

Classes	Dayton				Toledo				Youngstown			
	Floor Space		Value		Floor Space		Value		Floor Space		Value	
	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928
Commercial	393	317	2,381	1,709	1,452	997	8,698	5,162	228	177	748	641
Educational	324	45	2,165	500	182	150	1,705	824	114	4	790	100
Industrial	202	180	801	1,040	541	730	4,952	6,915	53	43	245	117
Public Utilities	—	—	1,972	586	13	45	6,655	5,530	190	—	2,602	7,321
Residential	2,009	908	12,081	4,749	1,183	1,359	5,456	6,605	642	1,377	2,999	6,166
Others	205	295	1,802	1,862	446	155	4,367	877	118	309	1,245	2,986
Total	3,132	1,746	21,202	10,446	3,816	3,436	31,833	25,912	1,344	1,910	8,629	17,781